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## Investigating Social Support as a Moderator of the Association between Adverse Childhood Experiences and Alcohol Use and Problems

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INVESTIGATING SOCIAL SUPPORT AS A MODERATOR OF THE ASSOCIATION  
BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND ALCOHOL USE AND  
PROBLEMS

A Thesis  
Presented to  
Faculty of the Department of Psychological Sciences  
Western Kentucky University  
Bowling Green, KY

In Partial Fulfillment  
Of the Requirements for the Degree  
Master of Science

By  
Sterling M. Hubbard

August 2021

INVESTIGATING SOCIAL SUPPORT AS A MODERATOR OF THE ASSOCIATION  
BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND ALCOHOL USE AND  
PROBLEMS

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Associate Provost for Research and Graduate Education

I dedicate this project to my mother, the strongest woman that I know, and to anyone else  
who survived a traumatic youth and working toward recovery.

## ACKNOWLEDGEMENTS

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# INVESTIGATING SOCIAL SUPPORT AS A MODERATOR OF THE ASSOCIATION BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND ALCOHOL USE AND PROBLEMS

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August 2021

36 Pages

Directed by Jenni B. Teeters, Elizabeth Lemerise, Matthew Woodward

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Unresolved childhood trauma, known as adverse childhood experiences (ACES), have been found previously to lead to a plethora of health disparities and increase the risk for problematic substance use, particularly alcohol use. However, protective factors, such as social support have been found to buffer against these consequences. The goal of this study was to highlight the connection between ACES and problematic alcohol use. Additionally, the aim was to investigate perceived social support as a moderator between ACES and problematic alcohol use and to examine the domains of social support and how they individually moderate the association between ACES and social support. Data were collected using an international online subject pool ( $n = 350$ ; 88.3% Caucasian, 66.9% female), with participants completing a battery of assessments to assess the topics of childhood trauma, perceived social support, and problematic alcohol use. Pearson's correlations were conducted to examine the associations among ACES, social support, and problematic alcohol use. The findings showed that ACES were related positively to problematic alcohol use, ACES were related negatively to overall social support and the friend, family, and significant other domains of social support. Additionally, problematic alcohol use was correlated negatively with overall perceived social support, friend, and significant other support. Moderation analyses were used to investigate whether overall social support and the various domains of social support moderated the association between

ACES and problematic alcohol use. Findings revealed that perceived family support significantly moderated ACES and alcohol use such that the relation between ACES and alcohol use was strongest at higher levels of support from family. There were no moderating effects found for overall social support and support from friends and significant other. In general, these findings contradict previous literature in that higher levels of family support were not associated with lower levels of problematic alcohol use. Future work is needed to explore additional factors that could impact the relations between social support, ACES, and problematic drinking.



## Introduction

About 61% of men and 51% of women in the United States report exposure to a traumatic event at least once in their lifetime (U. S. Department of Health & Human Services: Substance Abuse and Mental Health Services Administration, 2019b). If unrecognized, the effects of trauma can persist and lead to the development of mental health disorders, such as posttraumatic stress disorder (PTSD) and substance use disorder (SUD; U. S. Department of Health & Human Services: Substance Abuse and Mental Health Services Administration, 2019a). Though trauma is defined variously throughout the literature, one form of trauma that has been studied widely is childhood trauma, which includes family conflict, social and environmental distress, and experiences of abuse and neglect. Adverse childhood experiences (ACEs) can contribute to the development of unwanted physical and psychological symptoms and can increase a wide range of health disparities (Kalmakis & Chandler, 2014). One specific consequence that has been linked to childhood trauma is the harmful use of substances like drugs and alcohol (Konkolý Thege et al., 2017). Chronic substance misuse can lead to the development of a substance use disorder, and previous research has shown that the comorbidity of PTSD and SUD is especially challenging to treat (Batten & Hayes, 2005).

One factor that influences the development of, or recovery from, both PTSD and SUD is social support. Previous research has demonstrated that in general, the following relations exist: 1) trauma-related symptoms are associated with lower social support, 2) substance use disorders are associated with lower social support, and 3) trauma is associated with greater substance use. However, there is minimal research showing how

social support influences the relation between trauma exposure and substance use disorder. The goal of this study was to investigate how social support, as a moderating variable, may influence the association between trauma exposure and substance misuse. Though many forms of trauma and substance use exist, this study focused specifically on adverse childhood experiences and problematic alcohol use.

### **Trauma and Substance Use Disorder.**

Unresolved trauma can lead to the use of maladaptive coping strategies, such as substance use, which, over time, can result in a SUD (Konkolÿ Thege et al., 2017). After surviving traumatic event(s), individuals may begin to cope by misusing substances and then may have to go into rehabilitation, sobriety programs, or therapy programs to help them get through recovery (Konkolÿ Thege et al., 2017). Due to the difficulty in treating this comorbidity (PTSD and SUD), retention in treatment can be challenging (Batten & Hayes, 2005).

In a national survey managed by the Substance Abuse and Mental Health Services Administration (SAMHSA) in 2014, there were 20.2 million people who reported struggling with overusing substances. The abundance of people struggling with substance use demonstrates that substance use disorders (SUDs) are a significant public health concern in the United States (Lipari & Van Horn, 2017). Unfortunately, many individuals who struggle with mental health disorders, like PTSD and SUD, do not seek professional help. Although treatment retention has improved overtime, there is still an 18% dropout rate across PTSD treatment options (Imel et al., 2013). This increases the likelihood of developing SUDs due to the use of substances to self-medicate to relieve symptoms related to trauma (Konkolÿ Thege et al., 2017).

## **Adverse Childhood Experiences**

Traumatic experiences can happen during any time in the human lifespan, and for the purpose of this study, the focus was on trauma experienced during childhood.

Adverse childhood experiences (ACES) encompass a variety of harmful situations that directly impact children, such as neglect, abuse, parental conflict, parental substance use, parental mental illness, and incarceration of a relative (Hughes et al., 2017). These adverse experiences occur during a key developmental period and are known to lead to a greater risk for physical, social, emotional, and mental health-related consequences later in life. ACES are common, interrelated, and have a cumulative impact (Hayes-Grudo & Sheffield Morris, 2020). In the original ACES study, conducted on a sample of middle class, mostly educated adults with health insurance, the researchers found that physical abuse in childhood was the most common ACE reported and was associated with negative physical and mental health symptoms in adulthood (Felitti et al., 1998).

Due to extensive research on ACES and health behaviors, it is known that the consequences of ACES can be severe. As mentioned above, impacts of ACES are thought to be cumulative, meaning the more ACES an individual reports, the more likely they are to experience negative physical and mental health issues. Individuals who score three or higher on the ACE scale are at a much higher risk of potentially detrimental health-related behaviors like infant mortality, perpetrating or being a victim of violence, and teen pregnancies (Hayes-Grudo & Sheffield Morris, 2020). Individuals who have four or more ACES have been shown to be at a higher risk for risky sexual behavior and substance use, increased risk for cancer, diabetes, heart and lung disorders, and increased risk for depression, suicide, stress, and perpetrating intimate partner violence (Hayes-

Grudo & Sheffield Morris, 2020). Lastly, scoring six or more on the ACES scale has been linked to increased mortality rates and shortened life span by up to two decades (compared to someone who has zero ACES: Hayes-Grudo & Sheffield Morris, 2020).

Over time, there have been different ways that ACES have been studied and analyzed, but there are two leading ACES studies that have made a significant impact on how ACES have been examined in the literature. The original ACES study, conducted by the Centers for Disease Control and Prevention and Kaiser Permanente in 1995, examined the association between health risk behavior and disease in adulthood and the amount of exposure to childhood dysfunction (CDC, 2020). Felitti et al. (1998) analyzed childhood trauma in seven categories focusing on child abuse (emotional, sexual, and physical abuse), child neglect (emotional and physical neglect), and household dysfunction (substance use, incarceration, parental separation, residential instability, and parental discord). The researchers found that two-thirds of the population reported at least one ACE and that some populations were more vulnerable to experiencing ACES due to their socioeconomic statuses and the environments in which they lived (CDC, 2020). Subsequently, the World Health Organization (WHO) created a questionnaire that encompassed a broader range of traumatic events experienced during childhood that could also lead to severe consequences in adolescence and adulthood (WHO, 2012). The WHO expanded on the original categories. For example, in their measure, child abuse included discrimination, sexual exploitation, and peer violence, child neglect included items on labor trafficking and begging, and household dysfunction included items on domestic violence, death of a parent, exposure to chronic illness, and community dysfunction (WHO, 2012).

Notably, childhood trauma has been linked to substance use later in life. Previous research has found that those who scored higher on the Adverse Childhood Experience (ACE) Scale were more likely to develop a SUD later in life (Fuller-Thomson et al., 2016; LeTendre & Reed, 2017). Fuller-Thomson and colleagues' (2016) results showed that there was an association between three specific ACES, sexual abuse, physical abuse, and witnessing parental domestic abuse, and developing a substance use dependence. Similarly, in a clinical population, LeTendre and Reed (2016) found that with the increase in ACES, specifically emotional, sexual, and physical abuse, there was an increase in the likelihood of developing a cannabis or alcohol use disorder. Likewise, Skeer et al. (2015) suggested that familial conflict in childhood could increase the risk of substance misuse in adolescence and adulthood. Though much of the aforementioned research has focused on a binary score of the number of ACES endorsed (yes versus no), it could be argued that frequency of an adverse experience (the number of times each adverse experience occurred) could have a substantive influence on the likelihood of developing a substance use disorder in adulthood. Unfortunately, there is little work that addresses how often (as opposed to simply whether or not) ACES were experienced. The present study sought to fill this important gap in the literature by measuring the number of times a person experienced each ACE and examining how the frequency of ACES associated with the alcohol use and problems in adulthood.

## **Social Support**

Social support is one crucial function under the umbrella of a social network, which is identified as the social relationships between people (that may or may not provide social support; Heaney & Israel, 2008). To simplify this broad topic, Heaney and

Israel (2008) explained social support as a function of a social network and defined social support as “aid and assistance exchanged through social relationships and interpersonal transactions” (p. 191). For the purposes of the present study, perceived social support from friends, family, and significant others was measured.

In the substance use literature, many researchers focus on general characteristics of the social network, such as characteristics related to recovery housing, treatment programs, and a sense of community (Delany et al., 2009; Stevens et al., 2015). When examining the connection between trauma and substance use, most researchers focus on a broad conceptualization of perceived social support from various domains, such as friends, family members, and romantic partners (Birtel et al., 2017; Brown et al., 2013; Dworkin et al., 2018; Peter-Hagen & Ullman, 2014; Robinaugh et al., 2011; Ullman, 2000, Ullman et al., 2008). Social support has been shown to be influential during the recovery of individuals who struggle with diagnoses like PTSD and substance use disorder (Dworkin et al., 2018; Peter-Hagene & Ullman, 2014; Robinaugh et al., 2011). In particular, it is clear that social support from friends, family, and significant others can be useful in assisting a loved one through difficult times (Brown et al., 2013; Dworkin et al., 2018; McCabe et al., 2019; Peter-Hagene & Ullman et al., 2014). As such, social support in the current study was defined as perceived support from friends, family, and a significant other and was measured using the Multidimensional Scale of Perceived Social Support. This measure is used widely in trauma and substance use related literature, and it is valid in measuring the three domains of family, friends, and a “special person” as well as overall social support (Dahlem et al., 1991; Zimet et al. 1988).

### **Trauma and Social Support**

Although trauma cannot always be avoided, the social support that someone receives after a traumatic experience can have a significant impact on the severity of posttraumatic stress-related symptoms. Previous research suggests that social support is associated longitudinally with a decrease in posttraumatic stress disorder symptoms (Dworkin et al., 2018). Therefore, if an individual had a high-quality social support system, the social support received may serve as a buffer to stress, and that individual may experience less severe mental health symptoms, such as PTSD, anxiety, disordered sleep, substance misuse, depression, and other symptoms (APA, 2013).

Additionally, research has suggested that a lack of social support can result in adverse outcomes for some individuals after experiencing trauma. Robinaugh et al. (2011) found that negative posttrauma cognitions and poor perceptions of social support inhibited the natural recovery from posttrauma psychological distress. Also, Ullman (2000) found for sexual assault victims who disclosed their assault, negative post-disclosure behaviors from an individual in the support system had detrimental effects on the recovery of the sexual assault victim.

As described previously, ACES have been linked to the development of substance use disorders. However, the connection between ACES and social support has not been investigated extensively. Cheong and colleagues (2017) explored how perceived social support moderated the association between adverse childhood experiences and depression and found that ACES were associated with higher odds of later-life depressive symptoms, particularly for those with poor perceived social support in adulthood. Moreover, in another study examining mothers during pregnancy, Racine and colleagues (2018) found that mothers who had high ACES and perceived low social support had higher

antepartum health risks than mothers who also had high scores on ACES but higher levels of perceived social support (Racine et al., 2018).

### **Substance Use and Social Support**

Social support can influence someone in a state of change. Social support is an essential predictor for entry into treatment for substance use disorders. Stevens and colleagues (2015) found that improving factors like Alcohol Anonymous (AA) affiliation and a sense of community increase an individual's sense of overall social support and decrease stress-related to recovery. Likewise, a person's environment can hinder or improve their success in recovery (Kelly et al., 2010). For instance, according to research, there was a lower risk for relapse for drug-free individuals who had more substantial, less dense, and more diverse support networks (Panebianco et al., 2016). Panebianco and colleagues (2016) also found that a lower risk of relapse was associated with higher socioeconomic status, being married/cohabitating, more considerable occupational heterogeneity, and reciprocated support. Ultimately, how someone lives and the people with whom they spend time can impact the success of recovery. Previous research also shows that social factors can impact treatment outcomes for individuals struggling with comorbid PTSD and SUD. For instance, Peter-Hagen and Ullman (2014) found that perceived social support explained problematic substance use when there were negative social reactions to sexual assault disclosure.

### **Trauma, Social Support, and Substance Use**

Little work has examined the important domains of friends, family, or significant others on the connection between trauma exposure and problematic alcohol use. Studies that have examined all three variables have yielded mixed results. McCabe and



colleagues (2019) explored whether the indirect association of PTSD symptoms on alcohol use through drinking motives (reasons for drinking) was moderated by perceived social support from family and friends in a sample of veteran drinkers. They were interested in examining whether the explanatory role of drinking motives on PTSD-related alcohol use was stronger for those with high, average, or low levels of social support from family and friends. Their findings suggested that the indirect effect of PTSD symptoms on drinking levels through coping motives was moderated by perceived support from friends and family. Interestingly, the moderation effect was found for average levels of social support versus high or low support, suggesting that higher levels of social support from family and friends are not necessarily associated with lower alcohol use among those experiencing PTSD symptoms. These results suggest that an average level of perceived support buffers against higher drinking levels in this sample. In contrast, Dworkin and colleagues (2018) found that only support from friends was associated significantly and negatively with later PTSD among substance users. Similarly, Brown and colleagues (2013), found that support from friends for abstinence was associated positively with greater quality of life, as well as better psychological and social outcomes. It remains unclear how the various domains of social support may impact the connection between childhood trauma exposure and problematic drinking. It is possible that different domains of support could impact this association differentially.

In summary, social support is a crucial factor impacting the development of and recovery from trauma-related and substance use disorders. However, very little research has examined the connection between ACES, social support, and problematic alcohol use. Due to the well-established connection between ACES and health disparities,

including substance use (Hayes-Grudo & Sheffield Morris, 2020), it is critical to establish whether overall perceived social support, and, more specifically, social support from friends, family members, and romantic partners can buffer against the negative impacts of ACES on problematic alcohol use in adulthood.

### **Rationale for Current Study**

As stated previously, there is little previous research on the connection between social support, adverse childhood experiences, and substance use disorders. The goal of this study was to help to elucidate the connection between adverse childhood experiences and problematic alcohol use by exploring whether ACES and social support are associated with problematic alcohol use during adulthood (Hypothesis 1). Additionally, it was hypothesized that social support moderates the association between ACES and problematic alcohol use, such that individuals who experienced ACES who report greater social support will report less problematic alcohol use than individuals who experienced ACES who report less social support (Hypothesis 2). The moderating effect of certain domains of social support (family, friends or significant other) on the connection between ACES and problematic alcohol use also was explored (exploratory hypotheses).

Understanding the connection between these variables as well as the specific domains of support that impact the relations between ACES and problematic alcohol use could provide clinicians with important information relevant to intervention and treatment of adults who have experienced childhood trauma and struggle with alcohol use.

### **Method**

#### **Participants**

To increase the generalizability of the study, participants were recruited from an online, international subject pool called Prolific Academic. Prolific compensates participants monetarily (\$6.50 per hour minimum), giving access to over 70,000 possible participants worldwide. Prolific Academic is found to produce higher quality responses, similarly to Mechanical Turk, and has been found to provide a more diverse sample than both Mechanical Turk and CrowdFlower (Peer et al., 2017). The inclusion criteria to participate in the study were (a) age 18 and older, (b) residents of the United States and the United Kingdom, and (c) able to speak/read English. In total there were 368 participants recruited from Prolific Academic. During data cleaning, there were 18 individuals who were removed because they failed to complete the study in its entirety, bringing the sample to 350 participants, with an average age of 38.9 ( $SD = 13.76$ , range 18-83). Participants identified as 66.9% female, 32.9% male, and .3% transgender and 88.3% Caucasian, 3.7% Asian, 3.4% African American/British, .9% Hispanic, .3% Native American (.3%), 2.3% multiple racial identities and 1.1% “other.” Most of the participants were from the United Kingdom (87.77%) or United States (8.42%), household income reported as 7.4% less than \$10,000; 13.8% \$10,000 – 19,999; 17.2% 20,000-29,999; 13.8% \$30,000-39,999; 12.0% \$40,000-49,999; 10.9% \$50,000-59,999; 4.9% \$60,000-69,999; 6.6% \$70,000 -79,999; 2.6% \$80,000-89,999; 2.6% \$90,000-99,999; 4.6% \$100,000-149,999; 3.7% \$150,000 or more.

## **Procedure**

Western Kentucky University’s Institutional Review Board reviewed and approved the study prior to data collection. Once the fundamental issues of concern were addressed and approval was received, the survey was posted to Academic Prolific.

Participants had an informed consent form to review, which contained information regarding the purpose of the study, an explanation of procedures, confidentiality, benefits, risks, and the right to discontinue participation in the study at any point in the study. Participants had to digitally sign the form using their prolific identification number before they could complete the survey. Participants were able to complete the entire study online by using their smartphone, tablet, or computer. Participants completed a battery of self-reported assessments that measured the variables of interest (social support, trauma exposure during childhood, and substance use). To encourage participation, individuals who completed the survey were compensated \$4.50 for the 20-minute survey.

## **Measures**

*Perceived Social Support.* (Zimet et al., 1988). The MSPSS measures the perception of social support from friends, family, or a special person (romantic partner). It has been found to have strong construct validity and good internal and test-retest reliability (Zimet et al., 1988). The MSPSS is a 12-item measure that uses a seven-point Likert-type scale, where (1) is *strongly disagree* and (7) is *strongly agree* (Zimet et al., 1988). For instance, an item to measure the social support received from family is “my family will try to help me.” Likewise, social support from friends and a special person is assessed by questions like, “I can talk about my problems with my friends,” and “there is a special person whom I can share my joys and sorrows” (Zimet et al., 1988). Internal consistency for the current study was excellent ( $\alpha = 0.94$ ).

*Childhood Trauma.* Adverse Childhood Experiences Scale-International Questionnaire (ACES -IQ; WHO, 2012) is a 36-item scale that predicts long-term health disparities due to traumatic events experienced directly or witnessed during childhood.

The ACES-IQ scale has items related to emotional and physical abuse/neglect, peer victimization/isolation/rejection, parental separation, mother treated violently, low socioeconomic status, family member incarceration, sexual assault, and exposure to community violence (WHO, 2012). The larger the ACES' score, the greater the risk of experiencing mental health symptoms later in life (Finkelhor et al., 2015). The ACES-IQ can be analyzed in two different ways, 1) in a binary format, answering "yes" or "no" to items like, "Did a parent, guardian or other household member spank, slap, kick, punch or beat you up?" or 2) items can be analyzed in a frequency format by answering "refused," "never," "many times," "a few times," and "once" to the listed items. For this study, the ACES-IQ was analyzed in a frequency format. Frequency scores on items were to be summed, resulting a continuous variable with higher scores representing greater frequency of ACES. Although there are only few studies that have used this questionnaire, it has been shown to be a valid and valuable tool for assessing communities and populations who have experienced childhood violence (Hayes-Grudo & Sheffield Morris, 2020). According to a study investigating the psychometrics of the ACES-IQ, the scale had good internal-consistency ( $\alpha = .854$ ; Christoforou & Ferreira, 2020). This trend remained consistent with the current study having good internal consistency ( $\alpha = .86$ ).

*Problematic Alcohol Use.* Participants' problematic alcohol use was measured using the Alcohol Use Disorder Identification Test (AUDIT). The AUDIT has been used in adult, college student, and adolescent populations and according to a systematic review, the AUDIT has been shown to be highly valid and reliable with high internal consistency ( $\alpha = .80$ ) (de Meneses-Gaya et al., 2009). The measure demonstrated high

internal consistency in the current sample ( $\alpha = .86$ ). The AUDIT is a 10-item screening tool used to assess alcohol use and alcohol-related problems, (“Have you or someone else been injured because of your drinking?”), consumption (“How often do you have a drink containing alcohol?”), and drinking behaviors (“How often during the last year have you failed to do what was normally expected of you because of drinking; National Institute of Drug Abuse, 2018). The AUDIT scores range from 0 to 40, where 0 is someone who has never consumed alcohol, scores from 1-7 are considered low risk consumption, from 8 to 14 harmful or hazardous consumption, and 15 and above is a serious risk of alcohol dependence (NIDA, 2018; Saunders, 2021). The AUDIT has 10 questions, and the responses are scored as 0, 1, 2, 3, or 4 with the exception of items 9 and 10 scored as 0, 2, and 4. For instance, for the item asking “During the past year, how often have you failed to do what was normally expected of you because of drinking?” the answers consist of “Never” (scored 0), “less than monthly,” (scored 1), “monthly” (scored 2), “weekly” (scored 3), and daily or almost daily,” (scored 4; Saunders et al., 1993).

### **Data Analysis Plan**

Data were analyzed using the IBM Statistical Package for Social Sciences (SPSS) 27 software. To investigate our first hypothesis (that ACES and social support are associated with problematic alcohol use), Pearson’s correlations were conducted. Next, to investigate our second hypothesis (that social support will moderate the association between ACES and problematic alcohol use), a moderation analysis was performed using the PROCESS Macro model 1 (Hayes, 2013). The PROCESS macro computed an interaction variable (ACES x social support) to determine whether overall social support moderates the relations between ACES and problematic alcohol use. Additional

exploratory moderation analyses were conducted to determine whether different types of social support (family, friend, or special person) moderate the association between ACES and problematic alcohol use. Statistical significance was determined by 99% confidence intervals that do not contain zero. Significant interactions were probed according to Johnson-Neyman procedures via the PROCESS script for SPSS (Hayes, 2013). This technique pinpoints regions of significance of the moderator for the conditional effect of the predictor on the dependent variable allowing for a more precise examination of the moderator's effect (Hayes, 2013).

## Results

### **Baseline Characteristics**

There were 350 individuals who completed the ACES-IQ, with 13 subcategories (physical abuse, emotional abuse, contact sexual abuse, household drug use, incarcerated household member, mental illness, domestic violence, parental loss/separation, emotional neglect, physical neglect, bullying, community violence, and collective violence). Of these participants, 322 individuals (92%) reported at least one ACE on the ACES-IQ ( $M = 2.78$ ,  $SD = 2.5$ ). Table 1 is a frequency table that reports the thirteen subgroups of the ACES-IQ. Out of the 322 participants who completed the ACES-IQ, the subgroup community violence was the ACE most often reported ( $n = 186$ ), with parental loss/separation ( $n = 146$ ) and emotional neglect ( $n = 125$ ) following. Subgroups household member incarcerated ( $n = 12$ ), physical neglect ( $n = 18$ ), and collective violence ( $n = 23$ ) were the ACES that were least reported.

For AUDIT total score, which ranges from 0 to 40, a score of 8 or above is considered to harmful or hazardous drinking. For this sample, the reported AUDIT mean

score was 5.87 ( $SD = 5.3$ ); 64.3% of participants scored 7 or below on the AUDIT; 18.3% of participants scored 8 or above.

### **Analysis of Study Outcomes**

Pearson's correlations were used to examine the associations between social support, number of ACES, and problematic alcohol use (hypothesis 1). Table 2 reports the correlations between adverse childhood experiences (ACES-IQ), social support (MSPSS), domains of social support (MSPSS subscales), and problematic alcohol use (AUDIT). ACES were related significantly and positively to problematic alcohol use ( $r = .188, p = .002$ ). There were significant negative correlations between ACES and each domain of perceived social support, friend  $r = -.242, p = .000$ , special person ( $r = -.170, p = .002$ ), and family ( $r = -.446, p = .000$ ), and overall perceived social support ( $r = -.357, p = .000$ ). Similarly, there were significant negative associations between problematic alcohol use and two of the subgroups of perceived social support, special person ( $r = -.183, p = .002$ ), family ( $r = -.135, p = .023$ ), and overall perceived social support ( $r = -.148, p = .013$ ).

A moderation analysis was completed with the use of PROCESS macro version 3.5 to examine the moderating role of social support on the association between ACES and problematic alcohol use (hypothesis 2). In the moderation model, ACES was the predictor variable, overall perceived social support was the moderator, and problematic alcohol use was the outcome variable. The interaction variable ACES x perceived social support ( $b = .18, p = .105$ ) was not significantly associated with problematic alcohol use (see Table 4, Appendix D).



In order to explore the moderating effect of certain domains of social support (family, friends or significant other) on the connection between ACES and problematic alcohol use, three moderation models were run using the PROCESS macro with ACES as the predictor variable, perceived social support from friends (model 1), family (model 2), and a “special person” (model 3) as the moderator, and problematic alcohol use as the outcome variable (see Table 4, Appendix D). The interaction between ACES and perceived familial social support ( $b = .24, p < .008$ ) was significant (see Figure 1, Appendix E). The results indicated that perceived social support from family moderated the association between adverse childhood experiences and alcohol use and problems. Essentially, the connection between experiencing childhood trauma and problematic alcohol use was strongest at high levels of family support. Perceived social support from friends or a “special person” were not significant moderators of the association between ACES and problematic alcohol use.

## Discussion

The overarching goal of this study was to examine the connection between adverse childhood experiences, social support, and problematic alcohol use. In addition to highlighting this association, the second aim was to investigate how perceived social support moderated the association between adverse childhood experiences and problematic alcohol use. The final aim of this study was to explore the impact of the separate domains of perceived social support (friends, family, and special person) on the connection between ACES and problematic alcohol use.

It was hypothesized that ACES would be associated positively with problematic alcohol use. This hypothesis was supported and aligns with previous research showing

that higher scores on the ACES Scale were associated with greater likelihood of developing a substance use disorder later in life (Fuller-Thomson et al., 2016; LeTendre & Reed, 2017). Additionally, it was hypothesized that social support would be associated negatively with both adverse childhood experiences and alcohol use. This hypothesis was supported in that ACES were correlated negatively with each of the domains of perceived social support (family, friend, special person) and overall perceived social support. This result supports previous research showing a negative association between ACES and social support (Robinaugh et al., 2011). These findings are also in line with previous research showing that as perceived social support increases, there is a decrease in posttraumatic stress disorder-related symptoms, possibly serving as a protective factor toward adverse experience (Dworkin et al., 2018). Additionally, problematic alcohol use was correlated negatively with social support. These results are similar to previous findings in the literature showing that lower social support is associated with increased substance use (Skeer et al., 2015).

Hypothesis 2 stated that overall social support would moderate the relation between ACES and problematic alcohol use (the connection between ACES and problematic alcohol use will be stronger at low levels of social support). This hypothesis was not supported. Overall perceived social support did not moderate the association between ACES and problematic alcohol use. There was a significant positive correlation between ACES and problematic alcohol use, indicating that experiencing more ACES was associated with greater problematic alcohol use. This association was present regardless of levels of overall social support, indicating that ACES have a powerful impact on alcohol use that is not buffered by increased perceptions of general social

support. Notably, previous research has found that social support provided to substance users can have various impacts on substance use depending on the type and quality of that support (McCabe et al., 2019). In the present study, only ratings of perceived social support were examined, rather than type and quality of support. Future studies should include measures of type and quality of support provided to determine how these variables interact with ACES and problematic alcohol use. Similarly, it has been found that certain reactions and behaviors, such as controlling and infantilizing survivors after a trauma is disclosed can affect a trauma survivor negatively (Peter-Hagen & Ullman, 2014). For instance, if there were negative behaviors post-disclosure from support figures, these could have detrimental consequences for trauma survivors during recovery, like increased drinking behaviors and increased stress (Peter-Hagen & Ullman, 2014; Robinaugh et al., 2011; Ullman et al., 2000). Future research should measure reactions after disclosing the experience of an adverse childhood experience and how these reactions relate to problematic alcohol use.

Finally, hypothesis 3 was an exploratory hypothesis examining whether certain domains of social support (family vs. friend vs. special person) differentially moderated the relation between ACES and problematic alcohol use. It was found that social support from the family was the only domain that moderated the association between ACES and problematic alcohol use. Interestingly, the connection between ACES and problematic alcohol use was strongest at high levels of family support. Conversely, most of the literature suggests that familial support is beneficial to individuals who have ACES or problematic drinking patterns (Brown et al., 2013; Dworkin et al., 2018; McCabe et al., 2019; Peter-Hagene & Ullman et al., 2014). There are a few possible explanations for this

finding. For example, the substance use levels of the individual's family may have impacted the individual's substance use above and beyond perceived social support by family members. In studies of adolescent and young adult drinkers, parental alcohol use has been found to be a significant predictor of drinking levels (Stoolmiller et al., 2012). A recent systematic review by Knox and colleagues (2019) found that peer alcohol use was associated with adult alcohol consumption across 17 studies, clearly showing that the drinking habits of people in the social network have a powerful impact on one's own drinking. Additionally, the social network has been shown to influence recovery from a substance use disorder. According to the DSM-5, it is suggested that a person in alcohol recovery should have a strong family or support system to help improve the chances of a successful recovery (APA, 2013). This implies that the family is supportive of the individual's recovery. However, a family member could be supportive of another family member's recovery but not willing to change their own heavy or problematic drinking behaviors. Given that substance use disorders have a large genetic component, there is a strong chance that a person struggling with an alcohol use problem has family members who have struggled or are currently struggling with an alcohol use disorder (APA, 2013; Verhulst et al., 2014). If a person in recovery has a supportive family, but most of their family uses drugs and alcohol, the support system could reinforce the individual's drug and alcohol use unintentionally (McCabe et al., 2019). Unfortunately, the present study did not measure family history of substance use disorders, current levels of familial alcohol use, or familial attitudes towards substance use, so it remains unclear to what extent family member alcohol use influenced the present findings. It is also worth noting that the majority of this sample is from the United Kingdom, a country with high rates of

heavy episodic drinking in which drinking is socially accepted (Global Change Data Lab, 2010; Lee, 2020). Data shows that rates of alcohol consumption and alcohol use disorder are greater in the UK than the USA, and that supervised drinking with family members is more common (Lee, 2020; WHO, 2018). These are all factors that could have influenced the connection between ACES, family support, and problematic alcohol use in the present study.

Furthermore, the type of trauma experienced could have impacted both social support and development of problematic alcohol use behaviors. For instance, Fuller-Thomson and colleagues (2016) found an association between three specific ACES (sexual abuse, physical abuse, and witnessing parental domestic abuse) and substance use dependence. Similarly, in a clinical population, a connection was found between emotional, sexual, and physical abuse and an increase in the probability of developing a cannabis or alcohol use disorder (LeTendre & Reed, 2016). It is possible that certain types of traumas confer differential risk with regard to weakening social support and increasing problematic alcohol use. For instance, the current study found that the most common ACEs experienced in this sample were community violence (53.1%), parental loss/separation (41.7%), and emotional neglect (35.7%), which is different than findings from previous studies on ACES which found that physical abuse in childhood was the most commonly endorsed ACE. In the current study, physical abuse (10.9%), sexual abuse (13.1%), and domestic abuse (28%) were not among the most highly endorsed ACES. Future research should investigate whether certain types of ACES differentially impact levels of social support and substance use.

Although the findings of this study are noteworthy and give a different perspective of how social support may fit into the association between ACES and problematic alcohol use, one must consider the limitations of the study when interpreting the results. Firstly, nearly 88% of the sample was from the United Kingdom; therefore, the results of this study may represent trends from one specific country that may not generalize to other countries. Replication studies in geographically diverse samples are needed to determine if these findings extend to countries with differential drinking patterns. Similarly, the sample was majority Caucasian and female. Future research with a more diverse sample is needed, particularly examining how gender and age could impact the type of social support used and drinking behaviors. Also, self-report measures were used for all variables of interest. For future research, more objective measures of alcohol use, such as ecological momentary assessment or daily diaries could be used to counteract possible inaccuracies of retrospective self-reports. Lastly, perceived social support was measured contemporaneously, representing current levels of social support rather than childhood support. Future studies should examine the social support that was received during childhood to provide clarity on how social support buffers the consequences of specific risk factors.

Despite the limitations, the present study adds important findings to the literature on social support, ACES, and problematic alcohol use in adults. Additionally, this is one of only a few studies to use the Adverse Childhood Experiences Scale – International Questionnaire, which assesses a wider variety of adverse experiences than the original ACES. Although, the ACES-IQ is beneficial to use, it does not map on to past studies that use the original ACES scale with 10 subgroups, making it challenging to make

comparisons with previous research. Furthermore, the present study used an international online research platform, Prolific Academic, which allowed the chance to reach more diverse nationalities. Prolific is more reliable and user-friendly for both researcher and participant and yields higher quality responses than Mechanical Turk and Crowd Flower (Peer et al., 2017).

In summary, the present study highlights the importance of understanding the connections between social support, adverse childhood experiences, and alcohol use. Additionally, unresolved childhood trauma can increase the risk for developing problematic alcohol use and understanding the complicated role that family support plays within the association of ACES and problematic alcohol use is beneficial. Ultimately, future work is needed to explore additional factors that could impact the relations between social support, ACES, and problematic drinking.

## REFERENCES

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*, 5th ed. Arlington, VA: American Psychiatric Association.  
<https://doi.org/10.1176/appi.books.9780890425596>.
- Batten, S. V., & Hayes, S. C. (2005). Acceptance and commitment therapy in the treatment of comorbid substance abuse and posttraumatic stress disorder: A case study. *Clinical Case Studies*, 4(3), 246–262. <https://doi.org/10.1177/1534650103259689>
- Birtel, M. D., Wood, L., & Kempa, N. J. (2017). Stigma and social support in substance abuse: Implications for mental health and well-being. *Psychiatry Research*, 252 (1), 1–8.  
<https://doi.org/10.1016/j.psychres.2017.01.097>
- Brown, S., Jun, M. K., Min, M. O., & Tracy, E. M. (2013). Impact of dual disorders, trauma, and social support on quality of life among women in treatment for substance dependence. *Journal of Dual Diagnosis*, 9(1), 61–71.  
<https://doi.org/10.1080/15504263.2012.750147>
- Centers for Disease Control and Prevention. (April 2020). *About the CDC-Kaiser ACE study*. U.S. Department of Health and Human Services.  
<https://www.cdc.gov/violenceprevention/aces/index.html>
- Cheong, E. V., Sinnott, C., Dahly, D., & Kearney, P. M. (2017). Adverse childhood experiences (ACES) and later-life depression: Perceived social support as a potential protective factor. *British Medical Journal Open*, 7(9), e013228.  
<https://doi.org/10.1136/bmjopen-2016-013228>



- Christoforou, R., & Ferreira, N. (2020). Psychometric assessment of adverse childhood experiences international questionnaire (ACE-IQ) with adults engaging in non-suicidal self-injury. *Mediterranean Journal of Clinical Psychology*, 8(3).  
<https://doi.org/10.6092/2282-1619/mjcp-2601>
- Dahlem, N. W., Zimet, G. D., & Walker, R. R. (1991). The Multidimensional Scale of Perceived Social Support: A confirmation study. *Journal of Clinical Psychology*, 47(6), 756–761. [https://doi.org/10.1002/1097-4679\(199111\)47:6<756::AID-JCLP2270470605>3.0.CO;2-L](https://doi.org/10.1002/1097-4679(199111)47:6<756::AID-JCLP2270470605>3.0.CO;2-L)
- Delany, P. J., Shields, J. J., & Roberts, D. L. (2009). Program and client characteristics as predictors of the availability of social support services in community-based substance abuse treatment programs. *The Journal of Behavioral Health Services & Research*, 36(4), 450–464. <https://doi.org/10.1007/s11414-008-9153-z>
- de Meneses-Gaya, C., Zuardi, A. W., Loureiro, S. R., & Crippa, J. A. S. (2009). Alcohol use disorders identification test (AUDIT): An updated systematic review of psychometric properties. *Psychology & Neuroscience*, 2(1), 83–97.  
<https://doi.org/10.3922/j.psns.2009.1.12>
- Dworkin, E. R., Ojalehto, H., Bedard-Gilligan, M. A., Cadigan, J. M., & Kaysen, D. (2018). Social support predicts reductions in PTSD symptoms when substances are not used to cope: A longitudinal study of sexual assault survivors. *Journal of Affective Disorders*, 229 (16), 135–140. <https://doi.org/10.1016/j.jad.2017.12.042>

- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of adverse childhood experiences. *Child Abuse & Neglect*, 48, 13–21.  
<https://doi.org/10.1016/j.chiabu.2015.07.011>
- Fuller-Thomson, E., Roane, J. L., & Brennenstuhl, S. (2016). Three types of adverse childhood experiences, and alcohol and drug dependence among adults: an investigation using population-based data. *Substance Use & Misuse*, 51(11), 1451–1461.  
<https://doi.org/10.1080/10826084.2016.1181089>
- Global Change Data Lab. (2010). *Share of drinkers who have had a heavy drinking session in past 30 days*. Our World in Data. <https://ourworldindata.org/grapher/drinkers-had-a-heavy-session-in-past-30-days?tab=chart&country=NIC%7EYEM%7ECAN%7EITA%7EGBR%7EFRA%7ECHE%7EDEU%7ERUS%7EUSA>
- Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis: a regression-based approach. New York, NY: The Guilford Press. <https://doi.org/10.1111/jedm.12050>
- Hayes-Grudo, J. & Sheffield Morris, A. (2020). *Adverse and protective childhood experiences: A developmental perspective*. Washington, D. C.: American Psychological Association.

Heaney C. A., & Israel B.A. (2008). Social networks and social support. In Glanz K., Rimer B.K.,

Viswanath K. (Eds.), *Health behavior and health education: Theory, practice, and research*. 4th ed., pp. 190-210. San Francisco, CA. Jossey-Bass.

[https://is.muni.cz/el/1423/jaro2018/PSY289/um/readings/unit\\_1/Sallis\\_Chapter20\\_Health-Behavior-and-Health-Education\\_2008.pdf](https://is.muni.cz/el/1423/jaro2018/PSY289/um/readings/unit_1/Sallis_Chapter20_Health-Behavior-and-Health-Education_2008.pdf)

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., ... & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet Public Health*, 2(8), e356-e366.

Imel, Z. E., Laska, K., Jakupcak, M., & Simpson, T. L. (2013). Meta-analysis of dropout in treatments for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 81(3), 394–404. <https://doi.org/10.1037/a0031474>

Kalmakis, K. A., & Chandler, G. E. (2014). Adverse childhood experiences: Towards a clear conceptual meaning. *Journal of Advanced Nursing*, 70(7), 1489–1501. <https://doi.org/10.1111/jan.12329>

Kelly, S. M., O’Grady, K. E., Schwartz, R. P., Peterson, J. A., Wilson, M. E., & Brown, B. S. (2010). The relationship of social support to treatment entry and engagement: The community assessment inventory. *Substance Abuse*, 31(1), 43–52. <https://doi.org/10.1080/08897070903442640>

- Knox, J., Schneider, J., Greene, E., Nicholson, J., Hasin, D., & Sandfort, T. (2019). Using social network analysis to examine alcohol use among adults: A systematic review. *PloS one*, 14(8), e0221360
- Konkolý Thege, B., Horwood, L., Slater, L., Tan, M. C., Hodgins, D. C., & Wild, T. C. (2017). Relationship between interpersonal trauma exposure and addictive behaviors: A systematic review. *BioMed Central Psychiatry*, 17(1), 164.  
<https://doi.org/10.1186/s12888-017-1323-1>
- Lee, J. (2020, December 1). *US vs UK beer and alcohol consumption statistics*. Sobriety Hacker. <https://www.sobrietyhacker.com/fact-sheet/us-vs-uk-beer-alcohol-consumption-statistics/>
- LeTendre, M. L., & Reed, M. B. (2017). The effect of adverse childhood experience on clinical diagnosis of a substance use disorder: Results of a nationally representative study. *Substance Use & Misuse*, 52(6), 689–697.  
<https://doi.org/10.1080/10826084.2016.1253746>
- Lipari, R.N. & Van Horn, S.L. (2017). Trends in substance use disorders among age 18 or older. [https://www.samhsa.gov/data/sites/default/files/report\\_2790/ShortReport-2790.html](https://www.samhsa.gov/data/sites/default/files/report_2790/ShortReport-2790.html)
- McCabe, C. T., Mohr, C. D., Hammer, L. B., & Carlson, K. F. (2019). PTSD symptomology and motivated alcohol use among military service members: testing a conditional indirect effect model of social support. *Substance Use & Misuse*, 54(2), 257–270.  
<https://doi.org/10.1080/10826084.2018.1517176>

National Institute of Drug Abuse. *Screening and assessment tools chart* (June 2018).

<https://www.drugabuse.gov/sites/default/files/audit.pdf>

Panebianco, D., Gallupe, O., Carrington, P. J., & Colozzi, I. (2016). Personal support networks, social capital, and risk of relapse among individuals treated for substance use issues. *International Journal of Drug Policy*, 27(18), 146–153.

<https://doi.org/10.1016/j.drugpo.2015.09.009>

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153–163. <https://doi.org/10.1016/j.jesp.2017.01.006>.

Peter-Hagene, L. C., & Ullman, S. E. (2014). Social reactions to sexual assault disclosure and problem drinking: Mediating effects of perceived control and PTSD. *Journal of Interpersonal Violence*, 29(8), 1418–1437. <https://doi.org/10.1177/0886260513507137>

Racine, N., Madigan, S., Plamondon, A., Hetherington, E., McDonald, S., & Tough, S. (2018). Maternal adverse childhood experiences and antepartum risks: The moderating role of social support. *Archives of Women's Mental Health*, 21(6), 663–670.

<https://doi.org/10.1007/s00737-018-0826-1>

Robinaugh, D. J., Marques, L., Traeger, L. N., Marks, E. H., Sung, S. C., Beck, J. G., Pollack, M. H., & Simon, N. M. (2011). Understanding the relationship of perceived social support to posttrauma cognitions and posttraumatic stress disorder. *Journal of Anxiety Disorders*, 25(8), 1072–1078. <https://doi.org/10.1016/j.janxdis.2011.07.004>

Saunders, J. B. (2021). *Scoring the AUDIT*. Alcohol Use Disorder Identification Test.

<https://auditscreen.org/about/scoring-audit>

Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993).

development of the alcohol use disorders identification test (AUDIT): WHO

collaborative project on early detection of persons with harmful alcohol consumption-II.

*Addiction*, 88(6), 791–804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>

Skeer, M., McCormick, M. C., Normand, S. L., Buka, S. L., & Gilman, S. E. (2009). A

prospective study of familial conflict, psychological stress, and the development of

substance use disorders in adolescence. *Drug and Alcohol Dependence*, 104(1-2), 65–72.

<https://doi.org/10.1016/j.drugalcdep.2009.03.017>

Stevens, E., Jason, L. A., Ram, D., & Light, J. (2015). Investigating social support and

network relationships in substance use disorder recovery. *Substance Abuse*, 36(4), 396–

399. <https://doi.org/10.1080/08897077.2014.965870>

Stoolmiller, M., Wills, T. A., McClure, A. C., Tanski, S. E., Worth, K. A., Gerrard, M., &

Sargent, J. D. (2012). Comparing media and family predictors of alcohol use: a cohort

study of US adolescents. *BMJ open*, 2(1).

Ullman, S. E. (2000). Psychometric characteristics of the social reactions questionnaire: A

measure of reactions to sexual assault victims. *Psychology of Women Quarterly*, 24(3),

257–271. <https://doi.org/10.1111/j.1471-6402.2000.tb00208.x>

Ullman, S. E., Starzynski, L. L., Long, S. M., Mason, G. E., & Long, L. M. (2008). Exploring

the relationships of women's sexual assault disclosure, social reactions, and problem

drinking. *Journal of Interpersonal Violence*, 23(9), 1235–1257.

<https://doi.org/10.1177/0886260508314298>

U. S. Department of Health & Human Services: Substance Abuse and Mental Health Services Administration. (2019a). *Trauma*. <https://www.integration.samhsa.gov/clinical-practice/trauma>

U.S. Department of Health & Human Services: Substance Abuse and Mental Health Services Administration. (2019b, August 2). *Trauma and violence*. <https://www.samhsa.gov/trauma-violence>

Verhulst, B., Neale, M. C., & Kendler, K. S. (2014). The heritability of alcohol use disorders: a meta-analysis of twin and adoption studies. *Psychological Medicine*, 45(5), 1061–1072. <https://doi.org/10.1017/s0033291714002165>

World Health Organization. (2012). *Adverse Childhood Experiences International Questionnaire (ACE-IQ) – Rationale for ACE-IQ*. Geneva, Switzerland: Author.

World Health Organization. (2018). Global status report on alcohol and health 2018. World Health Organization. <https://apps.who.int/iris/handle/10665/274603>. License: CC BY-NC-SA 3.0 IGO

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30–41. [https://doi.org/10.1207/s15327752jpa5201\\_2](https://doi.org/10.1207/s15327752jpa5201_2)

## APPENDIX A

### Adverse Childhood Experiences – Subgroups

*Table 1.*

#### *Adverse Childhood Experiences – Subgroups*

N = 350	With ACE (n = 322, 92%)		Without ACE (n = 28, 8%)			
Subgroups (13)	<u>Ace Reported</u>		<u>ACE Not Reported</u>		<u>Missing</u>	
	n	%	n	%	n	%
Physical Abuse	38	10.9	310	88.6	2	.6
Emotional abuse	75	21.4	273	84.3	2	.6
Contact sexual abuse	46	13.1	295	84.3	9	2.6
Alcohol or drug use in household	47	13.4	301	86.0	2	.6
Chronic mental ill in household	91	26.0	257	73.4	2	.6
Domestic violence in household	98	28.0	246	70.3	6	1.7
Parental loss or separation	146	41.7	199	56.9	5	1.4
Emotional neglect	125	35.7	224	64.0	1	.3
Physical neglect	18	5.1	330	94.3	2	.6
Bullying	73	20.9	277	79.1		
Community violence	186	53.1	160	45.7	4	1.1
Collective violence	23	6.6	320	91.4	7	2.0
Incarcerated household member	12	3.4	336	96.0	2	.6

Note. Frequency of ACES reported separated by subgroup categories. There are 13

subgroups in the ACES-IQ. Out of the 350 participants who completed the study, 322 of them reported having an adverse childhood experience and 28 participants did not report having experienced any childhood trauma.



## APPENDIX B

### Correlations between ACES, Perceived Social Support, and Alcohol Problems

*Table 2.*

*Correlations between Gender, Age, Ethnicity, Socio-Economic Status (SES), ACES, Perceived Social Support, and Alcohol Problems*

	1	2	3	4	5	6	7	8	9
1. Gender	1								
Sig. (2-tailed)									
2. Age	.070	1							
Sig. (2-tailed)	.190								
3. Ethnicity	.027	-.107*	1						
Sig. (2-tailed)	.614	.045							
4. SES	-.066	-.037	-.017	1					
Sig. (2-tailed)	.218	.496	.753						
5. Problematic Alcohol Use	-.224**	-.135*	-.042	.140*	1				
Sig. (2-tailed)	.000	.021	.482	.017					
6. ACE	-.001	-.146**	.169**	-.130*	.188**	1			
Sig. (2-tailed)	.979	.008	.002	.019	.002				
7. Special Person Support	.107*	.021	-.083	.087	-	-.170**	1		
Sig. (2-tailed)	.045	.692	.121	.107	.002	.002			
8. Friend Support	.108*	-.045	-.013	.148**	-.010	-.242**	.493**	1	
Sig. (2-tailed)	.044	.401	.809	.006	.870	.000	.000		
9. Family Support	.079	.055	-.032	.083	-.135*	-.446**	.581**	.673**	1
Sig. (2-tailed)	.141	.311	.547	.125	.023	.000	.000	.000	
10. Total Social Support	.110*	.010	-.067	.109*	-.148*	-.357**	.819**	.806**	.905**
Sig. (2-tailed)	.042	.855	.215	.044	.013	.000	.000	.000	.000

Note\*\*. Correlation is significant at the .01 level (2-tailed). \*Correlation is significant at

the .05 level (2-tailed).

## APPENDIX C

### Descriptive Statistics for Age, Socio-Economic Status (SES), ACES, Perceived Social Support, and Alcohol Problems

*Table 3.*

*Descriptive Statistics for Age, Socio-Economic Status (SES), ACES, Perceived Social Support, and Alcohol Problems*

	Mean	Std. Deviation	N
Age	38.9	13.76	350
SES	4.98	2.95	349
Problematic Alcohol Use	5.87	5.29	289
ACE	2.89	2.75	322
Special Person Support	5.58	1.47	348
Friend Support	5.03	1.43	348
Family Support	4.99	1.44	346
Total Social Support	5.18	1.23	341

Note. Socio-economic status (SES) is coded from 1 to 12, with \$10,000 increments starting at 1 coded as “less than \$10,000” and 12 codes as “\$150,000 or more.”

## APPENDIX D

### Social Support as moderator of Adverse Childhood Experiences and Alcohol Use and Problems, with Subgroups of Family, Friend, and Special Person

*Table 4.*

*Social Support as moderator of Adverse Childhood Experiences and Alcohol Use and Problems, with Subgroups of Family, Friend, and Special Person.*

Predictor	$\beta$	$p$	95% CI
ACES x Total Social Support	.105	.180	-.038, .398
ACES x Friend Support	.084	.363	-.097, .264
ACES x Special Person Support	.056	.504	-.109, .221
ACES x Familial Support	.237	.008*	.063, .412

\* $p \leq .05$

## APPENDIX E

### Moderation Analysis between ACES, Alcohol Problems, and Perceived Familial Support

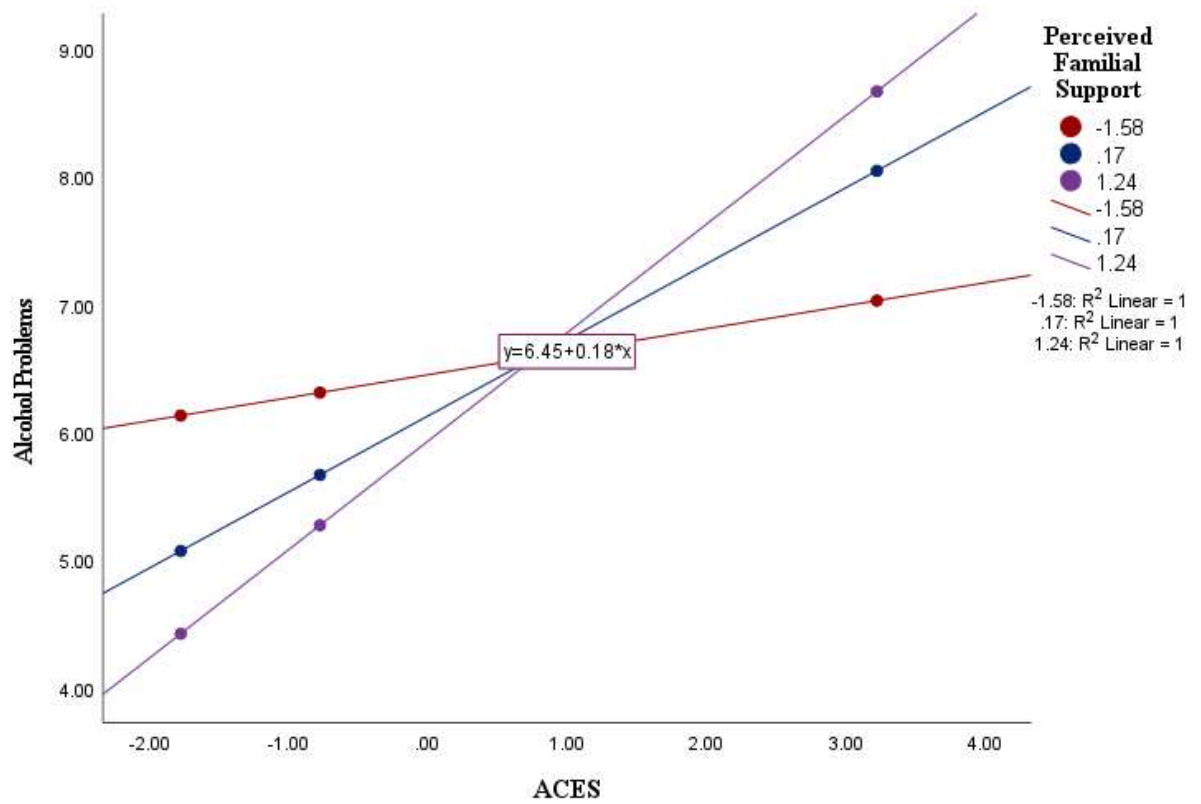


Figure 1. Interaction between Adverse Childhood Experiences and Perceived Familial Support on Problematic Alcohol Use.